THE RAFFLES BULLETIN OF ZOOLOGY 1999 **47**(1): 155-165

NEW RECORDS ON THE GENUS *NEOSTROMBOCEROS* ROHWER FROM INDIA (HYMENOPTERA: SYMPHYTA: TENTHREDINIDAE: SELANDRIINAE)

Malkiat S. Saini and **V. Vasu**
Department of Zoology, Punjabi University, Patiala-147002, India

ABSTRACT. - Four species of *Neostromboceros* Rohwer are added to the Indian fauna. Three species, *N. scutipunctatus*, *N. zomborii* and *N. albitarsus*, are new to science and one species, *N. minutus* (Enderlin), is recorded for the first time from this subcontinent. These species are described and illustrated. A key to the Indian species of this genus is provided.

KEY WORDS. - *Neostromboceros* Rohwer, new species, India, Hymenoptera, Selandriinae.

INTRODUCTION

Neostromboceros Rohwer is known only from the Oriental Region. Rohwer (1912) described this genus and designated *Strombocerοs metallica* from Singapore as type species. Several workers such as Konow (1901, 1908), Rohwer (1912, 1916), Enslin (1912), Enderlein (1919), Takeuchi (1929), Forsius (1925, 1931, 1933), Benson (1935), and Malaise (1944) added 37 species to this genus. Of these, only nine species are known from India: six described by Cameron (1888, 1899, 1902, 1907) *N. rothneyi, N. caeruleiceps, N. fuscinervis, N. pilicornis, N. trifoveatus,* and *N. basilineatus*; one is by Konow (1898) *N. laevis*; and two by Malaise (1944) *N. indobirmanus* and *N. speciosus*. Enderlein (1919) described *Stypoza* with *Stypoza cyanea* as its type species. This was synonymised under *Neostromboceros* by Malaise (1944), who was the first to provide a key to species.

The members of this genus can be identified as: Front wing with 2 radial and 3 or 4 cubital cells, 1st cubital crossvein frequently obliterate; basal vein mostly subparallel to 1st recurrent vein; anal cell without crossvein; hind wing with 2 closed middle cells and always with sessile anellan cell. Frontal area somewhat roundly elevated and the frontal depression, when present, mostly surrounded by indistinct and very blunt ridges. Malar space linear to distinct. Clypeus truncate to emarginate. Antennal joint 3 usually distinctly longer than 4, but

Received 12 Jun 1998 Accepted 18 Jan 1999

sometimes equal or shorter than 4; flagellum may be filiform, incrassinate or distinctly compressed; scape longer than pedicel. Epicnemium separated from mesopluron by fine, deep or distinct furrow. Tarsal claws with a large basal lobe, and subapical tooth shorter, equal or frequently longer than apical one and placed lateral to it.

The present text adds three new species and a first record of another species from India. The terminology used is after Ross (1937, 1945) and Malaise (1945). A key to the Indian species of this genus is provided. The type materials of the new species are housed at Division of Entomology, Pusa National Collections, Indian Agricultural Research Institute, New Delhi, India.

Abbreviations - EL: eye length, IATS: inner apical tibial spur, ICD: inter cenchri distance, IDMO: interocular distance at level of median ocellus, ITD: inter tegular distance, LID: lower interocular distance, MB: metabasitarsus, OATS: outer apical tibial spur, OCL: ocellooccipital line, OOL: oculoocellar line, POL: postocellar line.

TAXONOMY

Key to the Indian species of Genus *Neostromboceros* Rohwer

1. Abdomen with at least the middle tergites almost entirely fulvous or whitish 2
- Abdomen entirely black 3

2. Antennal segment 3 longer than 4 (Fig. 29); clypeus, scape and pedicel black ..... *N. pilicornis* (Cameron, 1899)
- Antennal segment 3 shorter than 4 (Fig. 31); clypeus, scape more or less and pedicel whitish ..... *N. speciosus* Malaise, 1944

3. Both clypeus and labrum brownish to black 4
- At least either of these partly or entirely whitish 7

4. Head punctate 5
- Head impunctate 6

5. Mesoscutellum with dense, irregular punctures distributed on posterior half (Fig. 32), antennal segments 3 and 4 as 5:4, postocellar area longer than broad as 5:4, tarsal claw with subapical tooth longer than apical one, head with frontal area almost impunctate ..... *N. scutipunctatus*, new species
- Mesoscutellum with a row of regular punctures on posterior margin only (Fig. 33), antennal segments 3 and 4 as 9:8, postocellar area broader than long as 5:4, tarsal claw with subapical tooth shorter than apical one, head with frontal area densely punctate ..... *N. zomborii*, new species

6. Metabasitarsus and following joints black, mesoscutellum with a row of distinct punctures on its posterior margin (Fig. 33), parapterum black, malar space 0.5 x diameter of median ocellus, postocellar area almost as long as broad, lateral furrows diverging posteriorly, antennal segments 3 and 4 as 4:3, tarsal claw with subapical tooth almost equal to apical one ..... *N. minutus* (Enderlin, 1919)
- Metabasitarsus and following 2 joints whitish or with brownish tinge, mesoscutellum with distinct punctures on posterior border and lateral sides (Fig. 34), malar space linear, postocellar area broader than long as 4:3, lateral furrows bulging medially, antennal segments 3 and 4 as 5:4, tarsal claw with subapical tooth shorter than apical one ..... *N. albitarsus*, new species
7. Frontal area coarsely rugose with subopaque lustre; (Lateral furrows diverging posteriorly, basal 2/3 of metatibia whitish entirely) ..... *N. rothneyi* (Cameron, 1888)
- Frontal area smooth and shining or with only inconspicuous setiguous punctures 8

8. Postocellar area distinctly longer than broad in female, sometimes subquadrate (little longer than broad) in the male 9
- Postocellar area either quadrate or broader than long in both sexes 10

9. Brim of antennal sockets strongly raised into acute carinae, separated by a semicircular interantennal incision; postocellar area longer than broad as 3:2; lateral furrows reduced to a punctiform pit behind each ocellus ..... *N. basilineatus* (Cameron, 1907)
- Brim of antennal sockets minutely raised and with narrow furrow along its base; postocellar area longer than broad as 5:4; lateral furrows reaching hypothetical hind margin of head ..... *N. fuscinervis* (Cameron, 1899)

10. Antenna distinctly compressed, and more or less distinctly triangular in cross-section; in male apex of each flagellar joint, except the last one, with a rather distinct hair-brush on median side; body with distinct bluish tinge 11
- Antenna not or hardly compressed; in cross-section more or less rounded; flagellar joints without hair brushes in male; body without any blue tinge 12

11. Inner margins of eyes distinctly converging downwards; clypeus impunctate; black dot on extreme apex of tibiae present ..... *N. laevis* (Konow, 1898)
- Inner margins of eyes subparallel; clypeus distinctly punctate; apical half of tibiae black ..... *N. caeruleiceps* (Cameron, 1899)

12. Head, thorax and abdomen entirely black; only legs with pale markings; postocellar area as long as broad ..... *N. trifoveatus* (Cameron, 1902)
- Whitish are: labrum, pronotal margin and parapterum; postocellar area broader than long ..... *N. indobirmanus* Malaise, 1944

Neostromboceros scutipunctatus, new species
(Figs. 1, 5, 9, 13, 17, 21, 25, 29, 33)

Material examined. - Holotype: Female, Sikkim, Namchi, 1500 m, coll. M. S. Saini, 16 May.1993.

Paratypes: 1 female, 1 male with same data as holotype.

Description. - Female: Average body length, 8.5 mm.

Colour: Body black, whitish are: extreme posterior margin of propodeum, posteromedial triangular spot on tergites 7, broad medial spot on tergite 8 and entire 9; metatibia and adjoining parts of coxae and femora, basal 1/2 of outer aspect of front four tibiae, basal 1/2 of metatibia. Wings hyaline, venation including costa, subcosta and stigma fuscous.

Structure: Antenna (Fig. 29) incrassate in middle, 1.8x head width, flagellum not compressed, segments 3 and 4 as 5:4. clypeus (Fig. 1) faintly incised, labrum (Fig. 1) broader than long as 3:2 with roundly pointed anterior margin, malar space linear; supraantennal pits double, shallowly confluenting, deep, anterior one minute. LID:IDMO:EL = 1:1.3:1.2. POL:OCL:OOL = 1:1.7:1.3. Frontal area at level of eyes, median fovea in form of shallow pits, one above supraclypeal area and other anterior to median ocellus; postocellar furrow absent, inter- and circumocellar furrows distinct; lateral furrows distinct, excurved, ending just before hypothetical hind margin of head; postocellar area convex, longer than broad as 5:4, head narrowing behind eyes. Hindwing vein 1r-m joining Rs away from its junction with R+Sc. ICD:ITD = 1:4, mesocutellum subconvex, appendage ecarinate. Tarsal claw (Fig. 5) with subapical tooth longer than apical one, basal lobe distinct; metabasitarsus longer than following 3 joints combined as 3:2, IATS:MB:OATS = 1:2.8:0.9. Ovipositor sheath as in fig. 9 (lateral view), fig. 13 (dorsal view). Lancet (Fig. 17) with 7 serrulae.

Sculpture: Head impunctate except frontal ridges and interocellar area that bear dense, minute, deep, distinct punctures. Mesonotum with dense, minute, widely separated punctures; mesoscutellum with deep, dense, distinct punctures on posterior half (Fig. 32), appendage impunctate; mesepisternum with dense, minute, deep, isolated punctures, more dense and somewhat microsculptured on anterodorsal convexity; mesosternum shallowly punctulate. Abdomen almost impunctate.

Pubescence: Silvery, 0.7x scape length.

Male.- Body length 7.5 mm. Similar to female. Genitalia: Penis valve (Fig. 21), Gonoforceps (Fig. 25).

Individual variation. All specimens alike.

Distribution. - India: Sikkim.

Remarks. - *Neostromboceros scutipunctatus* is separated from other Indian species by the mesoscutellum having dense, irregular punctures on its posterior half; frontal area with few, fine punctation, tarsal claw with subapical tooth longer than apical one, basal lobe distinct, and the black clypeus and labrum. The characters distinguishing it from its allied species *N. zomborii* are discussed in the succeeding key. In Malaise's (1944) key, this species is close to *N. rugifrons* Malaise, from which it can be separated by segment 3 and 4 as 5:4 (8:7 in *rugifrons*), postocellar area broader than long as 5:4 (as long as broad in *rugifrons*), subapical tooth of tarsal claw longer than apical one (almost equal in *rugifrons*), metabasitarsus longer than following 3 joints combined (equal in *rugifrons*), and head smooth (irregularly wrinkled in *rugifrons*).

Its type locality (Namchi) and its surrounding mountain ranges are comparatively dry in May. Due to large scale deforestation, the entire ground vegetation is intentionaly burnt every year which makes the area even more dry and barren. This is the reason that sawfly collections in this area are very scanty during the premonsoon days. Some of Konow's types are from this area but, unfortunately, the exact collection localities and dates of collection are not known.

Etymology. - The species name refers to the punctate mesoscutellum.

Neostromboceros zomborii, new species

(Figs. 2, 6, 10, 14, 18, 22, 26, 33)

Material examined. - Holotype: Female, Himachal Pradesh, Kalatop, 2400 m, coll. M. S. Saini, 27 Jul.1982.

Paratypes: 1 male with same data as holotype. Uttar Pradesh, Mandal, 2300 m, 2 males, coll. M. S. Saini, 15 Jun. 1983.

Description. - Female: Body length 7.5 mm.

Colour: Body black, whitish are: broad medial spot on tergites 8-9; hind four trochanters and adjoining parts of coxae and femora; anterior aspect of protibia more or less, basal 1/3 of anterior aspect of mesotibia, basal 1/3 of metatibia. Wings hyaline, apices infumated, venation including costa, subcosta and stigma fuscous.

Structure: Antenna (Fig. 29) incrassate in middle, 1.7x head width, flagellum not compressed, segments 3 and 4 as 9:8. Clypeus (Fig. 2) insignificantly emarginate, labrum (Fig. 2) broader than long as 3:2 with rounded anterior margin, malar space linear; supraantennal pits double, shallowly confluenting, deep, minute, size similar. LID:IDMO:EL = 1:1.5:1.2, POL:OCL:OOL = 1:1.8:1.4. Frontal area at level of eyes, median fovea in form of shallow pit; postocellar furrow absent, inter- and circumocellar furrows distinct; lateral furrows distinct, bulging medially and ending just before hypothetical hind margin of head; postocellar area convex, broader than long as 5:4, head narrowing behind eyes. hindwing vein 1r-m joining at junction of Rs with R+Sc. ICD:ITD = 1:3.5, mesoscutellum subconvex, appendage ecarinate. Tarsal claw (Fig. 6) with subapical tooth shorter than apical one, basal lobe distinct; metabasitarsus longer than following 3 joints combined as 3:2, IATS:MB:OATS = 1:2.8:0.9. Ovipositor sheath as in fig. 10 (lateral view) and in fig. 14 (dorsal view). Lancet (Fig. 18) with 6 serrulae.

Sculpture: Head with dense, shallow, confluenting punctures on frontal area. Thorax with fine, shallow, inconspicuous punctures except impunctate appendage, while posterior border of mesoscutellum bears a row of deep, distinct punctures (Fig. 33). Abdomen almost impunctate.

Pubescence: Silvery, 0.5x scape length.

Male. - Average length 7 mm. Similar to female except whitish spot on tergites 8-9 missing, complete anterior aspect of mesotibia whitish. Genitalia: Penis valve (Fig. 22), Gonoforceps (Fig. 26).

Individual variation. - All specimens alike.

Distribution. - India: Himachal Pradesh, Uttar Pradesh.

Remarks. - *N. zonborii* is allied to *N. rugifrons* Malaise in Malaise's (1944) key. Both species can be separated by antennal segments 3 and 4 as 9:8 (8:7 in *rugifrons*), postocellar area broader than long as 5:4 (as long as broad in *rugifrons*), subapical tooth of tarsal claw shorter than apical one (almost equal in *rugifrons*), metabasitarsus longer than following 3 joints combined (equal in *rugifrons*), and head with frontal area densely punctate (irregularly wrinkled in *rugifrons*).

Both collection sites are almost undisturbed (reserve forests) and thus, are very rich in low lying vegetation and varied kinds of insect fauna. Collection of the adults and the occurrance of selandrin sawfly larvae indicates that the species of ferns seem to support several species of *Neostromboceros* here.

Etymology. - This species is named in honour of Dr. L. Zombori, a sawfly worker, at Natural History Museum, Budapest, Hungary.

Neostromboceros albitarsus, new species
(Figs. 3, 7, 11, 16, 19, 23, 27, 30, 34)

Material examined. - Holotype: Female, Arunachal Pradesh, Nine mile (Bomdila), 1500 m, coll. V. Vasu, 24 May.1993.

Paratypes: 1 female, 1 male with same data as holotype — 1 female, Arunachal Pradesh, Jorum Top, 2000 m, coll. V. Vasu, 19 May.1992. — 1 male, Sessa, 1100 m, coll. M. S. Saini, 23 May.1993. — 1 female, 2 males, Dirang, 1500 m, coll. M. S. Saini, 30 May.1993. — 2 males, Lazu, 2200 m, coll. M. S. Saini, 5 May.1994. — 2 females, 2 males, Meghalaya, Elephant Falls (Shillong), 1450 m, coll. M. S. Saini, 1 May.1990. — 2 females, 1 male, Shillong, 1500 m, coll. V. Vasu, 30 Apr.1994. — 3 males, West Bengal, Mirik, 1700 m, coll. V. Vasu, 11 May.1993. — 1 male, Sikkim, Gangtok, 1600 m, coll. M. S. Saini, 14 May.1993. — 1 male, Namchi, 1500 m, coll. M. S. Saini, 18 May.1993. — 1 male, Singhik, 1400 m, coll. M. S. Saini, 8 May.1995. — 1 male, Himachal Pradesh, Kalatop, 2300 m, coll. M. S. Saini, 26 Jul.1982.

Description. - Female: Average body length 8 mm.

Colour: Body black, whitish are: narrow dorsal margin of pronotum, parapterum, posteromesal margin of propodeum, medial spot on tergites 8-9, all trochanters and adjoining parts of coxae and femora, basal 1/2 of anterior aspect of front four tibiae, basal 2/3 of metatibia, basitarsi and following 2 joints entirely but with brownish tinge of all legs. Wings hyaline, venation including costa, subcosta and stigma fuscous.

Structure: Antenna (Fig. 30) subincrassate in middle, 1.8x head width, flagellum insignificantly compressed, segments 3 and 4 as 5:4. Clypeus (Fig. 3) shallowly incised, labrum (Fig. 3) roundly pointed, broader than long as 3:2, malar space linear; supraantennal pits double, shallowly connected, deep, anterior one smaller. LID:IDMO:EL = 1:1.4:1.2, POL:OCL:OOL = 1:1.7:1.5. Frontal area almost at level of eyes, median fovea in form of shallow pits above supraclypeal area and broadly, shallowly reaching median ocellus; postocellar furrow absent, inter- and circumocellar furrows distinct; lateral furrows distinct, bulging medially, ending just before hypothetical hind margin of head; postocellar area convex, broader than long as 4:3, head narrowing behind eyes. hindwing vein 1r-m joining Rs away from its junction with R+Sc. ICD:ITD = 1:4.5, mesoscutellum subconvex, appendage ecarinate. Tarsal claw (Fig. 7) with subapical tooth shorter than apical one, basal lobe broad, metabaritarsus longer than following 3 joints combined as 4:3, IATS:MB:OATS = 1:2.5:0.9. Ovipositor sheath as in fig. 11 (lateral view) and in fig. 16 (dorsal view). Lancet (Fig. 19) having 7 serrulae.

Sculpture: Head and thorax impunctate, except a row of deep, distinct, pit-like punctures on posterior and lateral border of mesoscutellum (Fig. 34). Abdomen almost impunctate.

Pubescence: Silvery, 0.75x scape length.

Male. - Average length 7 mm. Similar to female. Genitalia: Penis valve (Fig. 23), gonoforceps (Fig. 27).

Individual variations.- Basal 1/2 to 3/4 of anterior aspect of tibiae whitish. Parapterum with brownish tinge.

Distribution. - India: Arunachal Pradesh, West Bengal, Sikkim, Himachal Pradesh.

Remarks. - *Neostromboceros albitarsus* is a widely distributed species almost along the entire Himalayan belt and prefers the semidry hill ranges up to the elevation of 2000 m. The entire colection was from the ferns growing along the hill tracks. Its flight period covers the premonsoon and monsoon months. This species is very close to *E.* minutus (Enderlin) in Malaise's (1944) key to species. The features separating it from its allied species, are discussed in the key.

Etymology. - The species name pertains to the whitish tarsi.

Neostromboceros minutus (Enderlin)

(Figs. 4, 8, 12, 16, 20, 24, 28, 35)

Stypoza minuta Enderlin, 1919: 369.
Neostromboceros minutus: Malaise: 1944: 38.

Material examined. - 1 female, 1 male, Manipur, Ukhrul, 1700 m, coll. M. S. Saini, 1 May.1990. — 14 females, 7 males, Himachal Pradesh, Kalatop, 2400 m, coll. M. S. Saini, 25 Jul.1992. — 1 male, Kasoli, 1400 m, coll. M. S. Saini, 1 May.1990. — 1 male, Uttar Pradesh, Gobindghat, 2000 m, coll. M. S. Saini, 18 Jun.1983. — 1 male, Mandal, 2400 m, coll. M. S. Saini, 15 Jun.1987. — 2 males, Ramgarh, 1800 m, coll. M. S, 20 Jun.1989. — 1 female, Saini, Kalamunitop, 2700 m, coll. V. Vasu, 24 Jun.1991. — 1 female, Munsyari, 2400 m, coll. Vasu, 19 Jun.1993. — 1 female, Sikkim, Gangtok, 1500 m, coll. M. S. Saini, 12 May.1983. — 4 males, Meghalaya, Cherapunji, 1450 m, coll. V. Vasu, 29 Apr.1994.

Description. - Female: Average body length 6 mm.

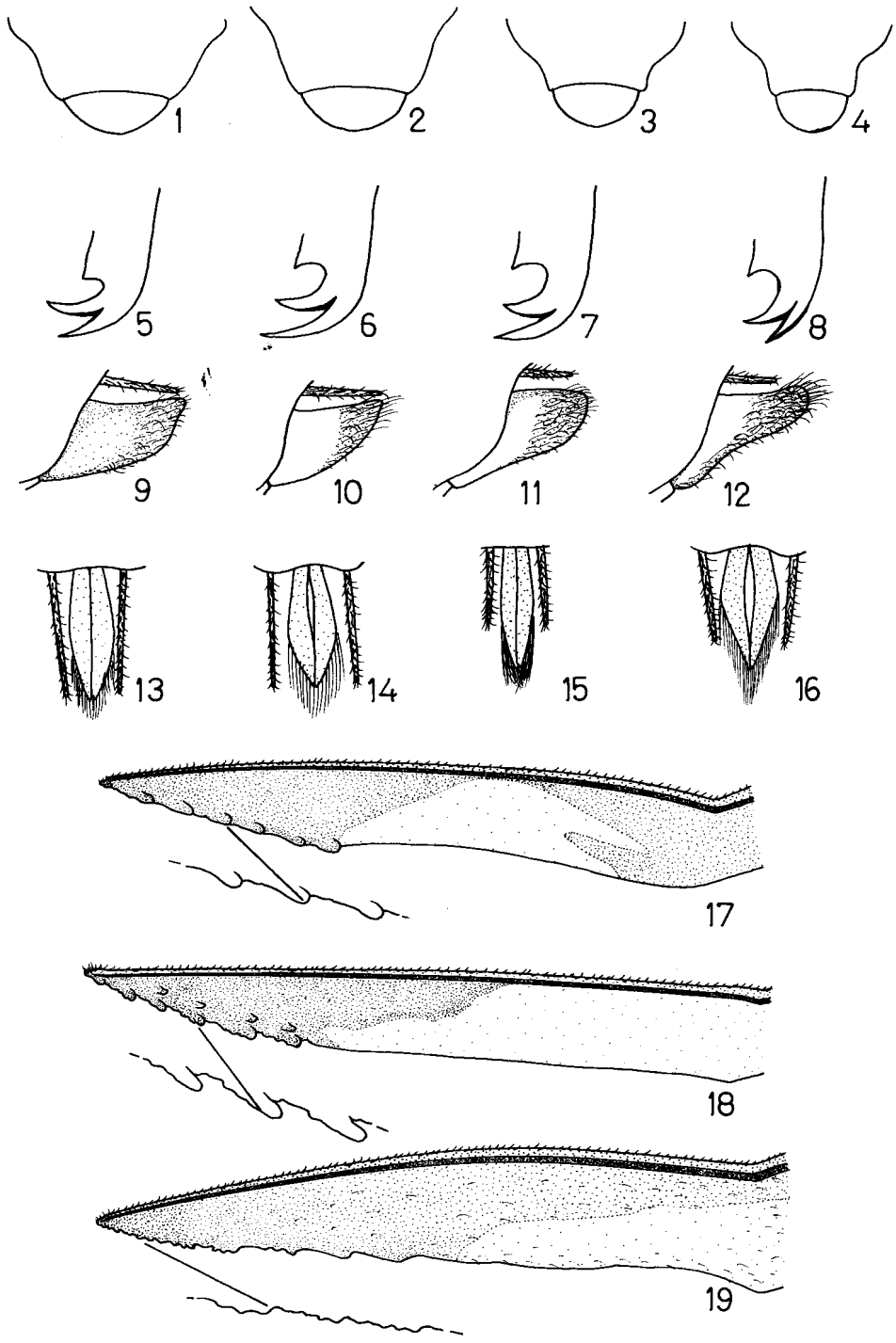
Colour: Body black, whitish are: extreme dorsal margin of poronotum, medial spot on tergites 8-9, all trochenters and adjoining parts of coxae and femora, basal 1/2 of anterior aspect of all tibiae. Wings hyaline, venation including costa, subcosta and stigma fuscous.

Structure: Antenna (Fig. 29) incrassate in middle, 1.7x head width, flagellum not compressed, segments 3 and 4 as 4:3. Clypeus (Fig. 4) shallowly incised, labrum (Fig. 4) broader than long as 3:2 with rounded anterior margin, malar space 0.5x diameter of median ocellus; supraantennal pits double, confluenting, deep, anterior one smaller. LID:IDMO:EL = 1:1:1, POL:OCL:OOL = 1:1.2:1. Frontal area at level of eyes, median fovea shallowly indicated above supraclypeal area and anterior to median ocellus; postocellar furrow absent, interocellor furrow fine, circumocellar furrow distinct; lateral furrows fine, diverging posteriorly (Fig. 35); postocellar area convex, almost as long as broad; head narrowing behind eyes. hindwing vein 1r-m joining Rs away from its junction with R+Sc. ICD:ITD = 1:4, mesoscutellum subconvex, appendage ecarinate. Tarsal claw (fig. 8) with subapical tooth almost equal to apical one, basal lobe distinct; metabasitarsus longer than following 3 joints combined as 6:5, IATS:MB:OATS = 1:2.5:0.9. Ovipositor sheath as in fig. 12 (lateral view) and in fig. 16 (dorsal view). Lancet (Fig. 20) having 7 serrulae.

Sculpture: Head and thorax impunctate except a row of deep, distinct punctures on posterior border of mesoscutellum (Fig. 33). Abdomen almost impunctate.

Pubescence: Silvery 0.5x scape length.

Male. - Average body length 5.5 mm. Similar to female. Gentalia: Penis valve (Fig. 24), gonoforceps (Fig. 28).



Figs. 1-4. Clypeus & labrum: 1. *Neostromboceros scutipunctatus*, 2. *N. zomborii*, 3. *N. albitarsus*, 4. *N. minutus;* Figs. 5-8. Tarsal claw: 5. *N. scutipunctatus*, 6. *N. zomborii*, 7. *N. albitarsus*, 8. *N. minutus;* Figs. 9-12. Lateral view of ovipositor sheath: 9. *N. scutipunctatus*, 10. *N. zomborii*, 11. *N. albitarsus*, 12. *N. minutus;* Figs. 13-16. Dorsal view of ovipositor sheath: 13. *N. scutipunctatus*, 14. *N. zomborii*, 15. *N. albitarsus*, 16. *N. minutus;* Figs. 17-19. Lancet: 17. *N. scutipunctatus*, 18. *N. zomborii*, 19. *N. albitarsus*.

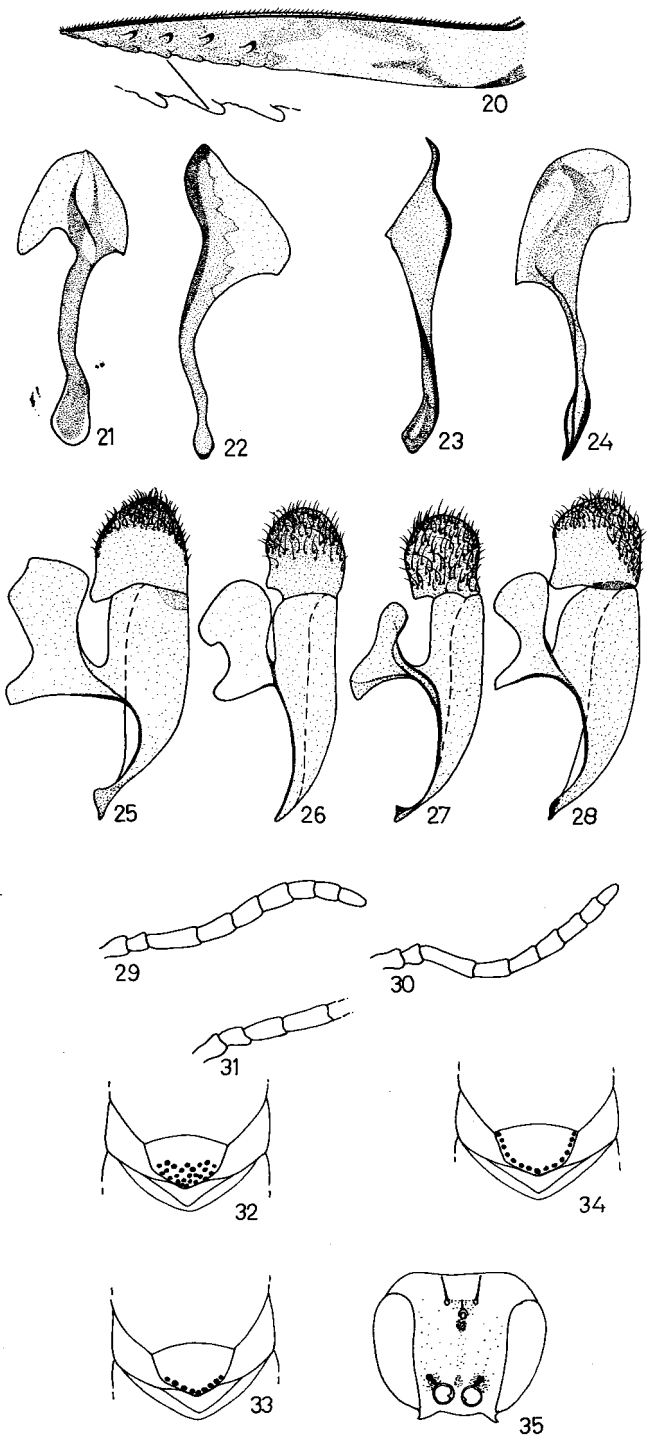


Fig. 20. Lancet of *Neostromboceros minutus;* Figs. 21-24. Penis valve: 21. *N. scutipunctatus*, 22. *N. zomborii*, 23. *N. albitarsus*, 24. *N. minutus;* Figs. 25-28. Gonoforceps: 25. *N. scutipunctatus*, 26. *N. zomborii*, 27. *N. albitarsus*, 28. *N. minutus;* Figs. 29-31. Antenna: 29. *N. scutipunctatus*, 30. *N. albitarsus*, 31.Basal segments of *N.speciosus;* Figs. 32-34. Dorsal view of mesoscutellum: 32. *N. scutipunctatus*, 33. *N. zomborii*, 34. *N. albitarsus*, Fig. 35. Front view of head of *N. minutus*.

Individual variations. - All specimens alike.

Distribution. - India: Manipur, Meghalaya, Uttar Pradesh, Himachal Pradesh, Sikkim.

Remarks. - All the specimens comply absolutely well with the available description by Enderlin (1919) and runs very smoothly in the key provided by Malaise (1944). The type could not be studied due to the non availability of the material. *Neostroboceros minutus* (Enderlin) is a widely distributed species on the low to median elevations of Himalaya. In comparison to other species, its flight time is much longer (April-July). Though it can be collected from broad leathery leafy vegetation growing in the filtered light, its abundance on ferns is comparatively more.

This species can be distinguished from other species by the following: mesoscutellum with a row of distinct punctation; parapterum black; narrow dorsal margin of pronotom whitish; malar space 0.5x diameter of median ocellus; postocellar area squarish; postocellar furrow absent and lateral furrows diverging posteriorly. Malaise (1944) compared this species with *N. trifoveatus* (Cameron), but they can be easily separated from each other by colour pattern, ratio of antennal segments 3 & 4, size of the antenna and size of the lateral supraantennal pits.

ACKNOWLEDGEMENTS

The authors are deeply indebted to Dr D. R. Smith, U. S. Department of Agriculture, Washington, D. C., for his valuable suggestions. Financial assistance rendered by USDA, Washington in collaboration with ICAR, New Delhi is also acknowledged.

LITERATURE CITED

Benson, R. B., 1935. A collection of sawflies (Hymenoptera, Symphyta) from Java. *Zool. Meded., Leiden*, **18**: 167-180.

Cameron, P., 1888. Descriptions of twenty three new species of Hymenoptera. *Mem. Proc. Manch. Lit. Phil. Soc.*, **4** (1): 159-183.

Cameron, P., 1899. Hymenoptera Orientalia, or contributions to a knowledge of Hymenoptera of the Oriental Zooligical Region Part VIII. The Hymenoptera of Khasia Hills. First paper. *Mem. Proc. Manch. Lit. Phil. Soc.*, **43** (3): 1-50.

Cameron, P., 1902. Descriptions of new genera and species of Hymenoptera, collected by Maj. C.S. Nurse at Dessa, Firozpur and Shimla, Part I. *J. Bombay. nat. Hist. Soc.*, **14**: 433-447.

Cameron, P., 1907. On some undescribed phytophagous and Parasitic Hymenoptera from the Oriental Zoological region. *Ann. Mag. Nat. Hist., London,* **7** (19): 166-192.

Enderlein, G., 1919. Zur Kenntnis der Tenthredininen. Sitzungsber. *Ges. Naturf. Freunde, Berlin*, **9**: 347-374.

Enslin, E., 1912. Edward Jacobson's Java-Ausbeute, Fam. Tenthredinoidea (Hym.) nebst Bestimmungstabelle der einschlagigen Gattungen. *Tijdschr. V. Ent.*, **55** (5): 104-126.

Forsius, R., 1925. J. B. corporaal's Tenthredinoiden - Ausbeute aus Sumatra. *Not. ent. Helsingfors*, **5**: 84-97.

Forsius, R., 1931. Ueber einige neue order wening bekannte orientische Tenthredinoiden. *Ann. natr. Mus. Wien.*, **46**: 29-48.

Forsius, R., 1933. Notes on a collection of Malaysian Tenthredinoidea (Hym.). *Raffles Mus. (Singapore) Bull.*, **8**: 169-193.

Konow, F. W., 1898. New Chalastogastra - Gattungen und Arten. *Ent. Nachr.*, **24** (17): 268-282.

Konow, F. W., 1901. Neue Chalastogastra - Arten. Termes. *Fuzetek.*, **24**: 57-72.

Konow, F. W., 1908. Neue Tenthrediniden aus Sikkim. *Zeit, System. Hymen. Dipt.*, **8**: 19-26.

Malaise, R., 1944. Entomological results from the Swedish expedition 1934 to Burma and British India. *Arkiv. zoologi.*, **35A** (10): 1-58.

Malaise, R., 1945. Tenthredinoidea of South-eastern Asia with a general Zoogeographical review. *Opusc. Entomol. Suppl.*, **4**: 1-288.

Rohwer, S. A., 1912. Notes on sawflies with description of new species, Washington D. C. Smithsonian Inst. *Proc. U. S. Nat. Mus.*, **43**: 205-251.

Rohwer, S. A., 1916. H. Sauter's Formosa - Ausbeute, Chalastogastra (Hymenoptera). *Sup. Ent.*, **5**: 81-113.

Ross, H. H., 1937. A generic classification of the Nearctic sawflies (Hymenoptera:Symphyta). III. *Biol. Monog.*, **34**: 1-173.

Ross, H. H., 1945. Sawfly genitalia: Terminology and Study Techniques. *Ent. News*, **56**: 261-268.

Takeuchi, K., 1929. Descriptions of new sawflies from Japanese Empire. *Trans. Nat. Hist. Soc. Formosa*, **19** (1): 495-520.